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Wood or Peabody, as full treatment of the extra-thermodynamic wastes as in Cotterill, or of experimental methods as in Carpenter ; but the book exhibits much of that rarest of talents, ability to condense, and, for an abridged work, maintains an extraordinarily high standard of scientific quality. The discussion of the 'entropy-temperature' diagram of Professor J. Willard Gibbs, which is only now, after many years, finding its place in the treatment of the heat motors, is the fullest and most satisfactory yet produced, not even excepting the work of its first trans-Atlantic advocate, Mr. J. Macfarlane Gray. This method of graphical treatment is gradually finding its place, and a very useful one, in the discussion of thermodynamic machines. Following Wood and Peabody, and later writers, this author has adopted, in all his own computations, the value, 778, for the thermodynamic equivalent obtained by Rowland. It may probably be safely asserted that this value is now universally accepted.

The unavoidable brevity with which all topics are treated in so small a space gives the reader occasion, frequently, to wish that the volume had been doubled in size, and fuller discussion and more of result thus secured ; but the book takes its place, among the many other treatises on the steam engine, as meeting a need that is being continually felt more and more by engineers, and which is not as well supplied by any other of the existing abridged discussions of the theory of the machine. It is well up to date in its practical aspects, as well as in the van on its purely scientific side.

R. H. THURSTON.

CORNELL UNIVERSITY.

An Introduction to Chemical Analysis for Beginners.—From the Sixth German Edition of DR. FR. RUDORFF.—Translated by CHAS. B. GIBSON and F. MENZEL.—Chicago, The W. J. Keener Co. 8 vo., 96 pp. Price \$1.00

This book is divided into two parts: Part I, Reactions; and Part II, Systematic Course of Qualitative Analysis. Metallic copper is the first substance examined, and then follow copper, zinc, zinc chloride, manganous sulphate, iron, lead, etc., in the order named. A careful examination of this part fails to detect any great novelty either of matter or arrangement. In Part II the metals are grouped under the familiar group reagents except that lead, mercury and silver are placed along with those precipitated by hydrogen sulfid and not, as is usual, separated under hydrochloric acid as group reagent. The scheme of analysis is well conceived, but offers little of novelty. The explanations and notes have been carefully adjusted to meet the needs of the student and are a valuable feature. The translation is, however, a very slovenly piece of work, and the nomenclature is especially bad. For example, on page 72, we find 'ammonic' sulfid written Am_2S , and lower down we have NH_4OH . Why the authors deny to bismuth cobalt and nickel the ic terminations which they give to nearly all the other metallic salts is not apparent. Several very awkward sentences occur. For example, in the introduction, "We have made a few additions calculated to assist the medical and dental student who suffers mainly the disadvantage of being unable to devote but a small part of his time to chemical studies."

The mechanical execution of the book is pretty good. There is no index.

EDWARD HART.

LAFAYETTE COLLEGE.

NOTES AND NEWS.

PALEOBOTANY.

A LARGE collection of fossil plants made by Professor W. P. Jenny in the Cretaceous rim of the Black Hills during the past field season has just been opened at the National Museum and proves to be of the highest interest to paleontology. It was made under

unusual difficulties and in the pure love of science in connection with Professor Jenney's work as a mining expert in the Black Hills. All the material comes from the lower portion of what was regarded by Professor Newton as the Dakota group; most of it from nearly the same horizon as that from which the gigantic cycadean trunks now so well known and the small collection of plants made by Jenney and Ward in September, 1893, were obtained (see *Journal of Geology* for April-May, 1894, Vol. II., No. 3, pp. 250-266). The collection has not yet been systematically worked up, but a casual examination of it shows that the plants have no relation to the true Dakota group, but are certainly as old as Lower Cretaceous and are probably of Kootanie age. The genera *Gleichenia*, *Cladophlebis*, *Zamites*, *Athrotaxis*, and many others characteristic of the Kootanie, the Trinity and the Potomac formations are represented, while no dicotyledonous leaves occur. Upon the whole they may be considered as a complete confirmation of the conclusion previously reached that the Dakota group of Newton must be subdivided and that a large portion of it belongs to the Lower Cretaceous. Professor Jenney is able to separate it into five distinct horizons, only the uppermost of which belongs to the Dakota of Meek and Hayden, between which and the underlying beds he finds an unconformity.

MR. LESTER F. WARD delivered two lectures on Jan. 8 and 10 before the Peabody Institute of Baltimore, on the *Vegetation of the Ancient World*, illustrated by over fifty lantern views. These were arranged in such a manner as to pass in review in their ascending geological order all the fossil floras known from the Silurian to the Pleistocene. The greater part of the illustrations were drawn from American material, and all the great plant bearing horizons of North Amer-

ica were represented by groups of typical and characteristic forms. Special attention was given to the wonderful fossil forests of this country, and especially of the National Yellowstone Park. The fossil flora of the Potomac formation, and particularly that of the State of Maryland and the City of Baltimore, were duly emphasized. Interspersed with these more scientific illustrations there were thrown on the screen a number of the magnificent ideal landscapes conceived and executed by the great scientific artists, Unger, Heer, Saporta and Dawson. The lectures were well adapted to give to the general public a systematic and comprehensive view of the forms of plant life that have inhabited the earth and especially those that have flourished in America throughout the past ages of geological time.

A TOPOGRAPHICAL ATLAS.

THE Director of the United States Geological Survey has recently submitted to the Secretary of the Interior an amendment to the 'Sundry Civil Bill,' now before Congress, authorizing the printing and distribution of an atlas of ten topographical mapsheets to the schools, academies and colleges of the country, the proposed atlas to contain illustrations of the various types of topographical form observed in the country, and to be accompanied by an explanatory bulletin which will serve as a primer of topography for school use.

If the amendment is carried, and the atlas meets the approval of teachers, it is proposed to distribute additional series in later years. Those who are interested in the advance of geography in the schools cannot do better than promptly to address their Congressman, asking for support of this excellent proposition. It is in effect an economical measure, for it will at a moderate cost give a wide and novel use to a large amount of material that has been gathered at great expense, and that is now stored

in the office of the Geological Survey, awaiting a limited distribution some years hence.

BIBLIOGRAPHY OF AMERICAN BOTANY.

THE Bibliography Committee of American botanists has just completed its first year of organized work in the production of an author catalogue of papers relating to American Botany. This has been printed in the monthly issues of the *Bulletin of the Torrey Botanical Club* and then reprinted on library cards by the Cambridge Botanical Supply Co. The editors have endeavored to make the record as complete as possible and it includes 575 titles. The committee and the editors earnestly request that their attention be called to omissions and that all interested aid in insuring completeness.

Foreign botanists are particularly requested to call our attention to any of their writings which refer to American plants. Communications may be addressed to the Editor of the *Torrey Botanical Club*, Columbia College, New York City.

GENERAL.

ON January 10th, Dr. George M. Dawson, C. M. G., F. R. S., was appointed Director of the Geological Survey of Canada, succeeding Dr. Selwyn, retired.

THE next annual meeting of the British Association for the Advancement of Science will be held at Ipswich, commencing on Wednesday, September 11th. Sir Douglas Galton is President-elect.

ACCORDING to the daily papers a party composed of Prof. Charles E. Hite, Alfred C. Harrison, Jr., Henry C. Walsh and Dr. J. Donnell McDonald sailed on Wednesday to Central America with a view to obtaining natural history and archæological collections. The expedition is under the auspices of the biological department of the University of Pennsylvania.

SCIENTIFIC JOURNALS.

AMERICAN CHEMICAL JOURNAL, JAN.

Contributions from the Laboratory of General Chemistry, University of Michigan:—(1) *On the Action of Chlorcarbonic Ester on Sodium Acetone*: By PAUL C. FREER. (2) *The Action of Metals on Nitric Acid*: By GEORGE O. HIGLEY. (3) *An Introductory Study of the Influence of the Substitution of Halogens in Acids, upon the Rate and Limit of Esterification*: By D. M. LIGHTY. (4) *On the Action of Sodium on the Esters of Aconitic and Citric Acids*. Preliminary Notice, by PAUL C. FREER.

The Combination of Sulphur with Iodine: By C. E. LINEBARGER.

Contributions from the Chemical Laboratories of the Massachusetts Institute of Technology:—*An Investigation of the Twitchell Method for the Determination of Rosin in Soap*: By THOMAS EVANS and I. E. BEACH.

A Laboratory Method for the Preparation of Potassium Fericyanide: By M. S. WALKER. *Reviews*.

THE PHYSICAL REVIEWS, JAN.—FEB.

The Apparent Forces between Fine Solid Particles Totally Immersed in Liquids—I: W. J. A. BLISS.

The Distribution of Energy in the Spectrum of the Glow-lamp: EDWARD L. NICHOLS.

The Influence of Heat and the Electric Current upon Young's Modulus for a Piano Wire: MARY C. NOYES.

Minor Contributions: (1) *On Magnetic Potential*: FREDERICK BEDELL. (2) *A Method for the Study of Transmission Spectra in the Ultra-violet*: ERNEST NICHOLS. (3) *The Photography of Manometric Flames*: WILLIAM HALLOCK.

THE AMERICAN NATURALIST, JAN.

Birds of New Guinea: GEORGE S. MEAD. *Leuciscus Balteatus (Richardson)*, *A Study in Variation*: CARL H. EIGENMANN.